DOCUMENT RESUME

ED 126 511 CS 202 842

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TITLE The Impact of Mode on Written Syntactic Complexity: Part II--Fourth Grade. Report No. 25.
INSTITUTION Georgia Univ., Athens. Dept. of Language Education.
PUB DATE 76
NOTE 31p.

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Cognitive Development; *Composition (Literary); Grade 4; Intermediate Grades; *Language Ability; Language Research; Language Skills; *Language Styles; Moral Development; Reading Comprehension; Syntax; *Written Language
IDENTIFIERS *T Unit

ABSTRACT

Writing samples representing argumentation, exposition, narration, and description were gathered from 52 fourth-grade pupils. Significant differences were found among the four modes of writing and among high, medium, and low ability groups, for T-unit length and clauses per T-unit; lesser differences also were found for clause length. Argumentation produced the most complex writing and description produced the least complex, with exposition and narration sharing an intermediary position which varied according to the measure chosen. Reading comprehension correlated positively with the measures of complexity. Relationships among cognitive, linguistic, and moral development are also discussed. (AA)

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THE IMPACT OF MOLE ON WRITTEN SYNTACTIC COMPLEXITY: PART II--FOURTH GRADE

by

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Studies in Language Education, Report No. 25
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June 1976

CS 202 842

This is the second in a series of reports concerning the impact of the four modes of discourse on the written syntactic complexity of elementary school children. This report, Part II, covers the writings of fourth graders. The over-all three-grade study (3rd, 4th, and 5th grades) covers the same time period, methods, and procedures in collecting and analyzing the data.

Part I revealed that third graders write at significantly different complexity levels in the different modes. It also showed that the argumentation mode accounted for the most complex syntax, followed by exposition and narration, which accounted for less complex syntax. The mode of description was shown to account for the least complex syntax of all the modes. Part I concluded that third graders are challenged by the different modes to produce different levels of syntactic complexity in their writing. It also suggested analogous explanations for experience's role in the Piagetian equilibration process--thus indicating further interconnections between cognitive and linguistic development.

Part II is concerned with the same questions as Part I: Do children write at different syntactic levels in different modes of discourse? Do they use different strategies to attain those different syntactic levels? How do the modes line up in relative rankings of impact on written syntactic complexity? What further indications might be suggested for writing instruction?

Background

A recent report of the National Assessment of Educational Progress (NAEP, 1975) showed that American students declined in writing abilities from 1969 to 1974. The NAEP collected writings from two groups of 2000

nine-year-olds at the beginning and end of the five-year period. Although the 1974 group wrote an average of 10 more words than their 1969 counterparts, they did so, according to Mellon (1976), "less coherently and in a manner that avoided awkwardness through the unfortunate expedient of immature sentence structure" (p. 70).

Mellon believed educators were responsible for the decline. In trying to keep up with the passing fads of educational methods, teachers had de-emphasized writing instruction. The main insight provided by the NAEP, said Mellon, was that "cutting back on the teaching of writing lessens the acquisition of writing ability" (p. 73). He said teachers should concentrate on reversing this situation:

> We should always be mindful of the truth long recognized by scholars of language and thought, that writing is the greatest tool of thinking ever invented by man; that it functions as an extension of the self allowing the writer to create a reality of thought, no less real for being thought, that is unique to verbal language and dependent for its ideational plenitude upon presentation in the written medium. To have achieved a degree of mastery over written language, to have known its production as a durable, detached artifact of one's own mind, and to have felt the pleasures of crafting, focusing, and qualifying that artifact, is as valuable a learning experience as a human being can have, even if one never again puts pen to paper or earns a dime thereby. (p. 73)

Writing is indeed a basic ingredient in learning. It allows us to recognize--and possibly re-think--our thoughts. As Smith has pointed out, we are seldom aware of our own thoughts until we use language to express what we are thinking:

> It is a truism that we often do not know what we think or feel about something until we talk about it, either aloud or silently...At some point in the language process (unless you are reciting something someone else has written) the thoughts that you are expressing must have been thoughts that you did not know you had." (1975, p. 114)

The act of writing is often a change ingredient for cognitive growth. Of course, language is not the only path to cognitive growth, but it

often provides the push we need--and the direction for progress.

How language performance contributes to cognitive change is still little understood. But its importance is becoming more obvious in research regarding children's early language performance. One revealing direction in research has been the relationship between modes of discourse and the syntax and quality of language products. In both writing and speaking, what is produced is determined by the mode-based purpose of the expression. For example, an argument differs from a description, both differ from an explanation, and all three differ from a narrative. However, less obvious in those differences are the underlying syntactic structures required in one mode as opposed to another. In the area of writing, judges trained to watch for specific qualitative aspects have consistently rated one mode higher than another. Apparently, language performance in writing has a functional and qualitative base attached to its underlying form.

Relationships between written syntactic structures and mode of discourse have been reported by Seegars (1933), Johnson (1967), Bortz (1969), San Jose (1972), and Perron (1976). This same relationship has been found in spoken utterances by Pope (1974). Relationships between mode and the quality of writing have been found by Veal and Tillman (1971). The evidence seems to be accumulating in one direction: function (or purpose) is related to underlying complexity (or form) in language use.

The modes of discourse also suggest connections between linguistic and cognitive development. This is exemplified in an experiment with first-grade writers by Anderson and Bashaw (1968). In their study, 10-minute discussion periods were used to encourage first graders to upgrade their skills in writing descriptive and argumentative themes. The findings showed that rated quality increased in description but not in argumentation themes. According to the authors, "The D (description) themes required

some logical organization of thought but a minimum of abstraction as compared to the writing of A (argumentation) themes" (p. 246). They refer to Piaget's claim (1951) that a lessening of ego-centrism and an increase in logical forms takes place in children 7-8 years of age (entering the concrete operational stage). They also point out that Piaget (1932) demonstrated that abstract, logical thought begins in verbal communication at about the first-grade age level.

But it is also the content of that "logical, abstract thought" which is of interest. In illustrating the importance of the social factor at the concrete operational stage, Piaget (1970) has shown how relationships with other children allow an active interrelating of differences: what one child does may be different but acceptable to another child. This encourages "reciprocity", as Piaget calls it. Such socializing also leads to "arguments and disagreements (which) give rise to negations and inverse operations" (1970, p. 129). Both reciprocity and inversion-negation encourage gains toward a major cognitive accomplishment, reversibility. As Piaget explains:

> Reversibility develops progressively in the course of the child's mental evolution. The child at the sensorimotor level is aware only of a practical reversibility in proximal space (the "group of displacements" built up during the second year of life) and the preoperational representations only present a semi-reversibility on the plane of thought linked to approximate regulations or compensations (correction of a gross error, etc.). The concrete operations comprise two parallel forms of reversibility, inversion and negation in the operations of classes and reciprocity in the operations of relations. (1970, p. 130)

Since argumentation seems linked to negation and inverse operations, the child entering the concrete operational level will not be forced into their strategies but will consume linguistic and experiential stimuli as the assimilation-accomodation processes allow. Gradually, they will develop a better grasp of reversibility and link up with the argumentation

mode of discourse. What children in the Anderson and Bashaw study could do well at the first-grade level was describe, apparently. They were not yet well versed in the inversion-negation operations necessary for argumentation. The various modes, then, have their linguistic and cognitive requirements, which appear to underlie writing and thinking, producing a developmental connection between them.

Cognitive and linguistic development, therefore, appear related in a complex way. Connections also have been suggested between cognitive and moral development (Kohlberg, 1973). Thus, the possibility also exists of some relationships between moral and linguistic development. This possibility is the subject of a research project currently under way at Bank Street College of Education in New York City and the University of Georgia (Fredericks and Perron, 1976). That project is directed toward determining possible correlations between linguistic and moral development stages in 10- and 11-year-olds. The indications of argumentation's more complex syntactic structures would incline the researchers to believe that conflict and dilemma situations, which are used by Kohlberg, are similar to--and therefore challenging in the same manner as--the syntactic challenges of the argumentation mode. Since Kohlberg's stage theory parallels Piaget's, it seems likely that correlations between cognitive and linguistic development might also be extended to moral development.

The preliminary indications of that study are that correlations are discoverable between higher syntactic complexity and the higher moral developmental judgments made by children at approximately the same cognitive stage. Such correlations, if the data now being assembled verifies, would present at least one possibility: the more arguable a situation, the more likely growth and development are potentially attributable to it. Thus, as in linguistic development, claims could be made in the area of moral

development as well as in cognitive development that argumentation situations not only present higher moral challenges but higher syntactic challenges, both being simultaneously related to cognitive development.

One of the related objectives of the current study, then, was to delve deeper into the interconnections discoverable among linguistic, cognitive, and moral development. Although grade level findings concerning the connections between mode of discourse and syntactic complexity are strong, children in one grade may vary considerably in ability level. Thus, the study mainly was directed toward an investigation of the impact of mode on written syntactic complexity by ability level. In Fall 1975, this writer undertook an investigation of the writings of 153 elementary school children at grades 3, 4, and 5.

The present report, Part II, confines itself to an examination of writings at the fourth-grade level. Parts I and III cover mode's effect on written syntactic complexity at the third and fifth grades, respectively. Part IV investigates the effect of mode on the written syntactic complexity of all the participants across the three grade levels.

Population and Procedures

The 52 fourth graders participating in this study underwent the same procedures at the same time as the third and fifth graders of Parts I and III. These fourth graders included 29 boys and 23 girls. All were white, enrolled in two self-contained classrooms in two different schools in the same Metro Atlanta school district.

Two fourth-grade teachers, both female, were coached in the same methods of collecting the writing as the teachers at the other grade levels. This involved four writing events, administered by the teachers themselves during a 40-minute time period in mid-morning. Two writings were collected each week for two weeks during October 1975. These four writings involved four mode topics. The teachers read the topics aloud and involved their classes in a five-minute discussion period before starting to write. Spelling and handwriting were not crucial concerns for the children, and they were also told that the papers would not be graded. They were informed that the writings were to be used to learn more about how children at their grade level learned to write.

Each writing topic was printed on a separate 8 x 10 sheet, preceded by lines for the student's name, name of school, and date. The papers contained triple-spaced lines on the topic side, and students were allowed to continue writing on the other side, if they filled up the front. The topics, according to the mode, were:

Argumentation: "Children may someday go to school all year long. Some children in San Diego, California, do it now. Do you think it is a good idea? Why or why not?"

Exposition: "Where do you go and what do you do after school? Do you have a special place to go, a job to do, a friend to play with? Would you like to take a new friend with you after school? What can you tell about the best thing to do after school?"

Narration: "Tell about a TV show that you like a lot. What happens in the show? How does it make you feel? Do you think other children would like it, too?"

Description: "Write about yourself. Tell what you look like. Tell what you like to do. What is your school like? What does your classroom look like? What do you do there? What do you do at recess? What is your favorite subject in school?"

In any mode-based study, it should be pointed out that the concept of "mode" is not a pure one. The fact that children are stimulated to write in

the mode of argumentation, for example, does not mean they will write in an argumentative way exclusively. Modes of writing overlap; children writing in exposition may take time out from their explanation to argue what's best at a critical point, to describe an entity being used, and even to narrate a related anecdote. This mixing of modes occurs in all writing.

With this in mind, then, this study defines mode as a production in which the writer's attention is directed in one of the following ways:

1. In using language that--in the main--argues a point of view, defends a position, expresses an emotional inclination, or tries to persuade, the writer is considered to be writing in the mode of argumentation.

2. In using language that--in the main--explains a procedure or an experience (in a restricted framework), the writer is considered to be writing in the mode of exposition.

3. In using language that--in the main--tells a sequence of events, observances, or experiences, the writer is considered to be writing in narration.

4. In using language that--in the main--depicts people, places, things, and/or events in detail, the writer is considered to be writing in description.

The over-all study takes its definition of mode from this researcher's level of comprehension regarding the differences involved, as noted above. The papers included in this study were those that met these criteria. Some 16 writings were eliminated in this process, leaving 208 writings to be analyzed as representing the four mode-based productions of the 52 children participating.

Approximately 470 words per student were produced in four writings. For the group comparisons involved in this study, it was felt that the above amounts were sufficiently representative.

The procedures used for segmenting the written productions into T-units were similar to those used by Hunt (1965), O'Donnell, Griffin,

and Norris (1967), and O'Hare (1973). They are described in full, along with a description of the syntactic factors, in Perron (1974, pp. 103-110). The syntactic factors in this study--T-unit length (words per T-unit), clauses per T-unit (dependent clauses per independent clause), and clause length (words per clause)--were chosen because they have been shown by Hunt (1965) to correlate with chronological and mental age. Also, they were among the 23 variables shown by San Jose to be significantly discriminating across the four modes.

The subgroupings at the fourth-grade level were accomplished in the same manner as was done with the other grades. High, middle, and low subgroups were established by means of reading comprehension scores obtained from the Gates-McGinitie tests administered in April 1975. Seven of the 52 students involved were recent transfers. Lacking such scores, they were not included in the subgrouping procedures or tests. Instead of raw scores, the grade equivalent scores were used for consistency with the later analysis of across-the-grades effects (Part IV).

The statistical procedures used in this study included Pearson's r, analysis of variance, and t-test procedures (Nie, 1975). Also, repeated measures procedures were utilized (Dixon, 1973). All tests were run on the IBM 360/370 systems through the Educational Research Laboratory at the University of Georgia. For all statistical procedures, the .05 level of significance was chosen as the most pertinent level because it was felt that a .1 level would have permitted possible Type I errors while a .01 level would have missed many valuable insights.

Specifically, Part II is designed to investigate the following questions concerning the impact of mode on written syntactic complexity at the fourth-grade level:

1. Are there differences between the boys and girls in age, reading comprehension, and written syntactic complexity as measured by three syntactic factors?

2. Are there differences between the girls and boys within each of the four modes regarding written syntactic complexity as measured by T-unit length means?

3. Based on ability groupings, are there differences among the high, middle, and low subgroups concerning age, reading comprehension, and written syntactic complexity as measured by three syntactic factors?

4. Are there differences among the high, middle, and low subgroups regarding written syntactic complexity as measured by T-unit length means within each of the four modes?

5. In each of the subgroups, are there differences across the four modes regarding written syntactic complexity as measured by three syntactic factors?

6. Based on the full group data, are there differences across the four modes in written syntactic complexity as measured by three syntactic factors?

7. If differences emerge across the modes in any of the three syntactic factors (#6, above), how do the modes line up (highest to lowest) and are their rankings different in a statistically significant way, one from another?

8. Finally, are there correlations among age, sex, reading comprehension, T-unit length, clauses per T-unit, and clause length means?

Findings

The first test run involved the possible differences in age, reading comprehension, and written syntactic complexity between the study's fourth-grade boys and girls. Table I shows the ages of both sexes as being fairly close; the 29 boys averaged 9 years, 5 months, while the 23 girls averaged 9 years, 3 months. These differences in age were not statistically significant.

Their reading comprehension grade equivalent means were also compared in Table I. The girls, with a higher average of 4.6 were not different in a statistically significant manner from the boys with a lower average of 4.0.

The three syntactic factors also failed to produce indications of

significant differences between girls and boys. In T-unit length means, the boys' lower 8.83 words per T-unit was not significantly different from the girls' higher 9.36 words per T-unit. In clauses per T-unit and clause length the girls' and boys' means were also not significantly different. Thus, in all three syntactic factors, differences between the sexes failed to surface in any statistically significant way.

TABLE I

COMPARISON OF BOYS AND GIRLS BY AGE, READING COMPREHENSION SCORES (RC), AND THREE SYNTACTIC FACTORS

Factor	N	BOYS (N=29)	SD	GIRLS (N=23)	SD	F-value
Age (yrs, mos)	52	9.5	.50	9.3	.32	2.52 (NS)
[1]RC	48	4.0	1.34	4.6	1.14	3.33 (NS)
Words/T-unit	52	8.83	1.76	9.36	1.80	1.17 (NS)
Clauses/T-unit	52	1.27	.17	1.31	.11	.98 (NS)
Words/Clause	52	6.94	.93	7.14	1.20	.45 (NS)

DF: 1,50 (F-value required at .05=4.03)

NS--not significant

[1]RC included 48 available Gates-McGinitie test scores (Boys, 28; Girls, 20). DF: 1,46 (F-value required at .05=4.05).

Comparing the written syntactic complexity of the two sexes within the four modes, Table II illustrates that the boys and girls do not differ significantly in T-unit length means. Although the girls write in a slightly more complex manner in all the modes but argumentation, these differences are not statistically significant.

TABLE II

COMPARISON OF BOYS AND GIRLS BY T-UNIT LENGTH MEANS

WITHIN THE FOUR MODES

Mode	Boys (N=29)	SD	Girls (N=24)	SD	F-value
Description	7.45	1.66	7.77	1.81	.44 (NS)
Narration	8.58	2.75	9.35	2.03	1.34 (NS)
Exposition	8.52	1.95	9.56	2.51	2.83 (NS)
Argumentation	13.00	4.87	12.57	3.21	.14 (NS)

DF: 1,50 (F-value required at .05=4.03)

NS--not significant

The students' assignments to subgroups based on their reading comprehension abilities allowed a comparison of high, middle, and low abilities. Table III indicates that placement was not dependent upon age. The low group's average age of 9 years, 6 months is above the middle group's average age of 9 years, 3 months and the high group's average age of 9 years, 4 months. These differences in age are not statistically significant. Since the group assignments were based on reading comprehension scores, significant differences were expected in that factor. In written syntactic complexity, the low, middle and high groups produced significantly different T-unit length and clauses per T-unit means--at or beyond the .001 level. However, their increasing clause length means--from low to high--did not differ enough to reach the .05 level.

TABLE III

DISTRIBUTION ACROSS RC SUBGROUPS OF AGE, T-UNIT LENGTHS, CLAUSES PER T-UNIT, AND CLAUSE LENGTH MEANS

Reading Comprehension (RC) Subgroups[1]

Factor	Low (N=15)	SD	Middle (N=15)	SD	High (N=15)	SD	F-value
Age (yrs, mos)	9.6	.52	9.3	.36	9.4	.48	1.10 (NS)
[1]RC	2.8	.58	4.4	.38	5.7	.54	126.78***
Words/T-unit	7.68	.37	9.14	1.44	10.25	1.77	12.18***
Clauses/T-unit	1.15	.08	1.32	.11	1.37	.14	15.07***
Words/Clause	6.68	.87	6.95	.92	7.49	1.22	2.49(NS)

DF: 2,42 (F-value required at .05=3.22; at .01=5.15; at .001=8.25)

NS--not significant
***--significant at or beyond the .001 level.

[1]At the time of testing (April 1975), the expected RC mean was 3.7.

The ability groupings were compared via repeated measures procedures, using T-unit length means to determine if syntactic complexity changed across the four modes. In Table IV, the results indicate that the students in the three ability groups wrote significantly different T-unit length means in all four modes. In all but the argumentation mode these differences move upwards from low to high ability group. In argumentation, although the differences among the three groups are significant, the middle group has attained a higher T-unit length mean than the high group; the low group falls a significant three full words per T-unit behind the high group, however.

TABLE IV

DISTRIBUTION ACROSS ABILITY GROUPS OF T-UNIT LENGTH MEANS WITHIN FOUR MODES

Mode	Reading Comprehension (RC) Subgroups: Low (N=15)	SD	Middle (N=15)	SD	High (N=15)	SD	F-value
Description	6.73	.82	7.20	1.28	8.63	2.06	6.52**
Narration	7.30	2.02	8.84	1.57	10.60	3.03	7.79**
Exposition	7.73	1.68	9.07	1.99	9.80	2.04	4.54*
Argument	10.43	3.61	14.63	4.74	13.55	3.30	4.62*

DF: 2,42 (F-value required at .05=3.22; at .01=5.15; at .001=8.25)

*--significant at or beyond the .05 level
**--significant at or beyond the .01 level

In Table V, the three syntactic factors are investigated via repeated measures procedures across the modes in each ability group. The results indicate that the low ability group writings showed a consistent difference from mode to mode in all three factors. In T-unit length and clauses per T-unit means, the differences are significant at or beyond the .001 level. In clause length means, the difference across the modes is significant at or beyond the .05 level.

The middle group produced similar results, with T-unit length and clauses per T-unit means shown as significantly different across the modes at or beyond the .001 level. However, differences across the mode based on clause length means--although nearing significance--failed to reach the .05 level. Similar results were produced in the

high group: while T-unit length and clauses per T-unit means differ significantly across the modes, clause length differences do not reach the .05 level of significance.

TABLE V

DISTRIBUTION ACROSS THE MODES OF THREE SYNTACTIC FACTORS BY ABILITY GROUP

Sub-group	Factor	MODES[1] D	N	E	A	F-value
LOW N=15	Words/T-unit	6.73	7.30	7.72	10.43	7.81***
	Clauses/T-unit	1.06	1.20	1.06	1.40	8.45***
	Words/Clause	6.35	5.14	7.30	7.48	2.79*
MID N=15	Words/T-unit	7.29	8.84	9.07	14.63	20.28***
	Clauses/T-unit	1.06	1.42	1.24	1.91	26.04***
	Words/Clause	6.89	6.30	7.31	7.82	2.74(NS)
HIGH N=15	Words/T-unit	8.63	10.60	9.80	13.55	9.28***
	Clauses/T-unit	1.14	1.65	1.18	1.82	17.78***
	Words/Clause	7.61	6.56	8.33	7.88	1.86(NS)

DF: 3,56 (F-value required at .05=2.78; at .01=4.16; at .001=6.60)

NS--not significant
*--significant at or beyond the .05 level.
***--significant at or beyond the .001 level.

Table VI compares the full group's productions across the modes. The results show that in all three syntactic factors--T-unit length, clauses per T-unit, and clause length means--the differences across

the modes are statistically significant at or beyond the .001 level.

In T-unit length means, the highest complexity is found in the mode of argumentation, while the lowest is found in description. This result holds also for clauses per T-unit. In clause length, argumentation and exposition appeared about even as the most complex while narration is the lowest here.

TABLE VI

DISTRIBUTION ACROSS THE MODES OF THE FULL GROUP'S THREE SYNTACTIC FACTORS

		MODES[1]				
Factor	N	D	N	E	A	F-value
Words/T-unit	52	7.59	8.91	8.98	12.81	83.32***
Clauses/T-unit	52	1.09	1.43	1.17	1.71	45.39***
Words/Clause	52	6.96	6.30	7.67	7.66	7.37***

DF: 3,204 (F-value required at .05=2.65; at .01=3.88; at .001=5.42)

***--significant at or beyond the .001 level.

[1]Modes: D= Description; N= Narration; E= Exposition; A= Argumentation

Having established significant differences across the modes based on repeated measures procedures in all three syntactic factors, two-tailed t-tests were run using paired modes to determine the relative rankings of the four modes in each syntactic factor.

Based on T-unit length means, Table VII indicates that argumentation accounts for the most complexity among the modes. It is significantly more complex than its nearest competition, exposition. Exposition, however, does not significantly differ from narration. But both are

significantly more complex than description.

TABLE VII

T-TESTS OF T-UNIT LENGTH MEANS ACROSS PAIRED MODES

Mode X Mode (N=52)	Words/ T-unit	SD	T-value	2-Tailed Prob.	Rela- tionships
Description (D)	7.59	1.72			
			-4.52	.000	N > D
Narration (N)	8.91	2.47			
Description (D)	7.59	1.72			
			-5.22	.000	A > D
Argumentatation (A)	12.81	4.18			
Description (D)	7.59	1.72			
			-4.81	.000	E > D
Exposition (E)	8.98	2.26			
Narration (N)	8.91	2.47			
			-6.05	.000	A > N
Argumentation (A)	12.81	4.18			
Narration (N)	8.91	2.47			
			- .22	.82	N=E
Exposition (E)	8.98	2.26			
Argumentation (A)	12.81	4.18			
			6.57	.000	A > E
Exposition (E)	8.98	2.26			

Full Relationships: A > N = E > D

Table VIII illustrates that a similar result occurs when t-tests are run on paired modes to determine the relative rankings of the modes

based on clauses per T-unit means. Again, argumentation is shown as significantly more complex than its closest rival, narration, which in turn is significantly more complex than exposition, which is significantly more complex than description, the least complex mode here.

TABLE VIII

T-TESTS OF CLAUSES PER T-UNIT MEANS ACROSS PAIRED MODES

Mode X Mode (N=52)		Clauses/ T-unit	SD	Difference T-value	2-Tailed Prob.	Relationships
Description	(D)	1.09	.11	-8.64	.000	N > D
Narration	(N)	1.43	.30			
Description	(D)	1.09	.11	-9.24	.000	A > D
Argumentation	(A)	1.71	.48			
Description	(D)	1.09	.11	-3.17	.003	E > D
Exposition	(E)	1.17	.17			
Narration	(N)	1.43	.30	-3.86	.000	A > N
Argumentation	(A)	1.71	.48			
Narration	(N)	1.43	.30	5.75	.000	N > E
Exposition	(E)	1.17	.17			
Argumentation	(A)	1.71	.48	8.19	.000	A > E
Exposition	(E)	1.17	.17			

Full Relationships: A > N > E > D

Table IX shows the results of t-tests run with paired modes based on clause length means. The significant difference which emerged in the repeated measures procedures (Table VI) is shown to result from a tie

between argumentation and exposition as significantly more complex modes than description, which in turn is significantly more complex than narration.

TABLE IX

T-TESTS OF CLAUSE LENGTH MEANS ACROSS PAIRED MODES

Mode X Mode (N=52)		Words/ Clause	SD	Difference T-value	2-Tailed Prob.	Relationships
Description	(D)	6.96	1.41	2.51	.01	D > N
Narration	(N)	6.30	1.58			
Description	(D)	6.96	1.41	-2.28	.03	A > D
Argument	(A)	7.66	2.17			
Description	(D)	6.96	1.41	-2.79	.007	E > D
Exposition	(E)	7.67	1.71			
Narration	(N)	6.30	1.58	-3.59	.001	A > N
Argument	(A)	7.66	2.17			
Narration	(N)	6.30	1.58	-5.37	.000	E > N
Exposition	(E)	7.67	1.71			
Argument	(A)	7.66	2.17	- .04	.97	A = E
Exposition	(E)	7.67	1.71			

Full Relationships: A=E > D > N

Summarizing the relative rankings of the modes in the three syntactic factors investigated, argumentation and description are shown as consistently the most complex and least complex modes, respectively, based on T-unit length and clauses per T-unit means. With regard to T-unit length, exposition and narration are tied in the middle, but

with regard to clauses per T-unit, narration is shown to be more complex than exposition. In the clause length factor, argumentation and exposition are tied in front, followed at a significantly lower complexity level by description, which in turn is followed at a significantly lower complexity level by narration. Apparently, exposition and narration are tied at the same complexity level in T-unit length means because of different clausal processes. Exposition excels in encouraging lengthier clauses, while narration excels in encouraging the use of more dependent clauses. Description is last on the T-unit length list; although it appears to encourage lengthier clauses than does narration, description encourages the least number of dependent clauses of all the modes.

Table X illustrates the results of the Pearson's Product-Moment procedures. Age, sex, reading comprehension, T-unit length, clauses per T-unit, and clause length are investigated for possible correlations. The results show that age and sex correlate neither with one another nor with T-unit length, clauses per T-unit, nor clause length.

Reading comprehension correlates with T-unit length, clauses per T-unit, and clause length. T-unit length correlates with clauses per T-unit, and clause length, but clauses per T-unit and clause length do not correlate.

Thus, T-unit length, clauses per T-unit, and clause length, the three syntactic factors which represent writing complexity in this study, correlate with reading comprehension abilities as indications of similar measurements of human abilities.

TABLE X

CORRELATION COEFFICIENTS AMONG AGE, SEX, READING COMPREHENSION (RC) SCORES, T-UNIT LENGTH, CLAUSES PER T-UNIT, AND CLAUSE LENGTH MEANS

Factor X Factor	Cases	Coefficient	Two-Tailed Significance
Age by:			
RC	48	-.2640	.07
Sex	52	-.2193	.12
T-unit length	52	-.0096	.95
Clauses/T-unit	52	-.0118	.93
Words/Clause	52	-.0078	.96
RC by:			
Sex	48	.2598	.08
T-unit Length	48	.5578	.001
Clauses/T-unit	48	.6439	.001
Words/Clause	48	.2928	.04
Sex by:			
T-unit Length	52	.1512	.28
Clauses/T-unit	52	.1384	.32
Words/Clause	52	.0946	.50
T-unit Length by:			
Clauses/T-unit	52	.6530	.001
Words/Clause	52	.8125	.001
Clauses/T-unit by:			
Words/Clause	52	.0958	.50

Conclusions

Part II has found mode to be an important consideration in research and evaluation of the writing of fourth graders. The findings validate earlier claims (Seegars, 1933; San Jose, 1972), as well

as reaffirm the findings of Part I (Perron, 1976). They allow the following conclusions:

1. No significant differences were found between fourth-grade girls and boys in age, reading comprehension, or the three syntactic factors--T-unit length, clauses per T-unit, and clause length means. Boys and girls, therefore, are shown in this study to be of similar ability in reading comprehension and writing.

2. Comparing their productions within each of the four modes, the boys and girls also wrote at similar ability levels in argumentation, exposition, narration, and description.

3. Ability group comparisons showed that writing ability, measured by increasing T-unit length and clauses per T-unit means, did line up comparably to the reading ability levels. The match did not hold, however, for clause length means, which indicated that writing ability involving increasing lengths of all clauses does not compare well with reading comprehension abilities at this grade level.

4. The writings of the high, middle, and low ability groups significantly differed in T-unit length means when compared within the four modes. These differences were related to a consistent increase in complexity from low to high group within three of the four modes. The only change in direction came in the argumentation mode where the middle group produced more complex T-units than the high group. The possible explanation for this appears to involve one child's unique (and possibly mode-based) tendency to expand a structure (such as a clause) played off against another child's unique (and possibly mode-based) tendency to increase the number of dependent clauses. Some insights into this complex issue will be offered in No. 7 below.

5. When the separate ability groups were investigated according to writing complexity across the modes, T-unit length and clauses per T-unit means showed significant differences at each ability level--at or beyond the .001 level. Looking at clause length means, however, the low ability students wrote papers that significantly differed across the modes, while the middle and high ability students wrote papers that did not significantly differ across the modes. Although the middle group's differences across the modes did approach significance, the decreasing tendency became evident in the high group's insignificant differences. This point will be dealt with further in No. 7 below.

6. When all 52 fourth graders' writings were compared, all three syntactic factors illustrated that mode is a significant variable--at or beyond the .001 level. The fourth graders of this study produced significantly different syntactic complexity from one mode to the next. As in Part I, the results of Part II indicate that mode is capable of encouraging higher levels of syntactic complexity in children's writing.

7. With statistically significant differences occurring in all three syntactic factors across the modes, the next question involved the actual differences produced in writing complexity from mode to mode. According to T-unit length means, "the best index of grade level" in writing analysis (Hunt, 1965, p. 50), the mode of argumentation was significantly more complex than the other three modes. Narration and exposition were tied as the next most complex of the modes, while description was the least complex mode. Thus, based on these findings, fourth-grade children writing in the argumentation mode will produce more syntactic complexity than they will writing in any of the other modes investigated. Conversely, children writing in the mode of description will produce less syntactic complexity than they will writing in any of the other modes investigated. When we look at the numbers of dependent clauses (clauses per T-unit), we find that argumentation produces the most complexity, followed by narration, then exposition, and finally, description. In the last factor, clause length, exposition ties with argumentation as the most complex modes in the length of all clauses used. Description is next, followed by narration. Thus, argumentation appears to call for more complex T-units through two clause processes:

   (a) increasing the numbers of dependent clauses, and

   (b) increasing the length of dependent and independent clauses.

Exposition and narration are tied for second place, exposition gaining its position by increasing the length of all clauses (b), and narration gaining its place by increasing the numbers of dependent clauses (a). Description is shown to be the least complex of all the modes investigated--based on T-unit length means. Although it appears to have gained this position by registering the fewest dependent clauses, it does better than narration in the length of its clauses. Hunt (1965) claimed:

> Fourth graders lengthen their clauses so very little beyond the minimum...that any individual differences among them in this regard do not show up in T-unit length. Instead, clause length differences are completely overshadowed by differences in the number of these clauses, short at best, which are combined into T-units. (pp. 44 and 47)

The evidence of this study indicates that this conclusion may be subject to question. Hunt used a mixed collection of writing, without any one mode base distinguished. Such a collection could have been influenced by variable mode effects. Since narration appears to encourage more complexity through increasing the numbers of dependent clauses while exposition seems to encourage more complexity by increasing the lengths of all clauses, there is a likelihood that Hunt's 1,000-word

collections were picking up influences from mixtures of the modes. Further research is indicated in this area, especially since Hunt has claimed that younger students depend more on one process (a) while older students depend more on the other (b). It may be--as the findings here indicate for younger writers--that neither process is more important at either period. As the two modes of exposition and narration appear tied behind argumentation, based on T-unit length means, they seem to depend upon different processes for the same results. Such different processes may be two of the major prerequisites for all gains at all levels of syntactic maturity. Limited cognitive development may incline younger writers toward less challenging modes. However, since writers seldom produce pure modes, it seems more likely that the mixing of various syntactic strategies (as shown in #4 above) and the ability range of the writer (as shown in #5 above) directs writers--regardless of age level--toward one process or the other. In any event, further research--at this level and with higher grade levels--could reveal the differences between cognitive development and mode-oriented effects.

8. In comparing the different factors with one another to investigate possible correlations, age and sex were shown to correlate neither with one another nor with any other factor. Reading comprehension means did correlate with T-unit length, clauses per T-unit, and clause length means. T-unit length means also correlated with clauses per T-unit and clause length means. But clauses per T-unit and clause length means did not correlate. Thus, the sex of the fourth graders of this study had little bearing on their reading comprehension or writing abilities. Boys did as well as girls. Also, the increasing numbers of dependent clauses and the increasing lengths of all clauses were shown to be important ingredients in T-unit expansion. However, an increase in the numbers of dependent clauses had little to do with an increase in the lengths of the clauses used--or vice versa. The two processes, then, appear to work independently in writing development, even though they both play a crucial role in creating more complex T-units.

In summarizing the conclusions of Part II, mode has been shown to play a significant role in the evaluation and research of writing at the fourth-grade level. T-unit length and clauses per T-unit factors were shown to be more discriminating in their ability to analyze syntactic complexity from mode to mode and from ability group to ability group than clause length at this level. T-unit length is dependent on both of the other factors, while those factors apparently have little bearing on one another.

The report indicates that children writing in the mode of argumentation will produce higher amounts of syntactic complexity than they would writing

in other modes. The difference between written syntactic complexity in exposition and narration mainly depends upon the analytical tool used--that is, whether one is measuring the average number of dependent clauses per independent clause or the average length of all clauses. Finally, the mode of description consistently has been shown as the mode encouraging the least amount of written syntactic complexity at this grade level.

Implications

Fourth graders apparently write more or less complexly depending on the mode employed. The different modes of argumentation, exposition, narration, and description apparently present different syntactic challenges to these children.

In Part I, it was shown that third graders' written productions differ significantly from mode to mode. Part II has found that fourth-grade written productions differ significantly in a similar fashion. Obviously, the implications presented in Part I also hold for Part II. Detailed comparisons will be presented in the report on the findings made across the third, fourth, and fifth grades (Part IV).

However, some further implications have emerged. One is the possibility for an alternative suggestion for Piaget's description of inversion-negation processes leading from social arguments and disagreements in the concrete operational stage. As evidenced by the continuously higher syntactic complexity demonstrated in the mode of argumentation, children may be encouraged to higher syntactic development at each stage of cognitive development.

Thus, instead of certain phases of cognitive operations being endorsed at one stage or another, various embryonic forms of such operations may lie deeper in the linguistic faculty than formerly believed. And in

lying deeper, they may only be recognizable after a certain level of cognitive maturation has been attained. This alternative explanation would involve the argumentation processes of negation-inversion in classes and reciprocity in relations as one form of a normal--across the stages--permanent stimulation in cognitive development.

This implication also underwrites the possibility that argumentation and its accompanying embellishments (often referred to as "conflict," "setback," or "dilemma" in moral development) appear to be likely candidates for the role of positive stimulator in linguistic, cognitive, and moral development.

In writing instruction, this would translate into a plausible suggestion supporting the use of conflict and dilemma--two problem-solving situations--in the classroom. Both contribute to the development of written syntactic structures because of their base in the argumentation mode. And their connection to moral development (Kohlberg, 1973) as the basic stimulator for growth from stage to stage--in a similar manner as Piaget's cognitive stage growth--would illustrate basic interrelations among all three intellectual processes.

A note of caution should be inserted here, however. The above implications regarding argumentation should be accompanied by a warning that man does not live by argumentation alone. All the modes of discourse are important parts of the learning process. In writing, this simply means that, along with narration and description, fourth graders should be involved in writing in expository and argumentative modes. That is, besides writing stories and describing things, the children should be encouraged to explain the processes and procedures surrounding and backgrounding their life experiences. In addition, they should also be

involved in writing argumentatively and persuasively regarding their involvement in conflicting reality.

In cognitive development, this cautionary note translates into an appeal for involving children in experiences that call for descriptive sensing, narrative sequencing, expository fact-finding, and argumentative conflict resolution. In moral development, perhaps the cautionary note would translate into an appeal for including more than merely argumentative conflict and dilemma. Although this could be tempered by findings that would show conflict and dilemma to involve descriptive insight, narrative awareness, and expositional realization, as well as argumentative revelation.

Summary

In this study, the four modes of argumentation, exposition, narration, and description have been shown to result in significantly different levels of written syntactic complexity at the fourth-grade level. As Part I, so Part II may be interpreted as finding that writing development is an internally predisposed process which may be stimulated naturally by writing in varying modes. Interconnections among cognitive, linguistic, and moral development also were pointed out, with analogous implications that point to similar development--in a natural manner by functional experiences which structurally vary in the equilibration process. All three human intellectual processes appear to involve a connected pathway toward development.

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